

-- Electrostrictive polymer-polymer actuators or other electroactive polymer actuators that provide enhanced strain capabilities can shape, tune, position, control and deform membrane structures, as well as perform in other applications, in ways not previously possible with other materials. An example of such an electrostrictive polymer-polymer actuator is described in the patent application entitled "Polymer-Polymer Bilayer Actuator", Serial No. 09/696,524, filed October 23, 2000, hereby incorporated by reference. The greater strain capability provides further possibilities for small-scale applications and integration into skin surfaces. The electroactive actuators can coincide with specific contours to optimize, for example, shapes for fluid flow, reflection and other membrane uses.--

(3)

Please replace the paragraph beginning at page 9, line 25, with the following rewritten paragraph:

--Referring now to FIG. 6, the thickness variation of one or more layers is chosen to achieve a desired contour. The thickness of a layer can vary as any function of length ($t=f(l)$), any function of width ($t=f(w)$), or as any function of both length and width ($t=f(l,w)$). This thickness variation acts in cooperation with and/or enhances the contour that could be achieved by material choice, electrode design, or orientation of layers.--

(4)

Please replace the Brief Description of the Drawings paragraph beginning at page 5, line 15, with the following rewritten paragraph:

--A more complete appreciation of the invention and the many of the attendant advantages thereof will be readily attained as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings, wherein:

FIG. 1A illustrates a side view of an embodiment of a non-uniform thickness actuator, showing the most responsive portions located at the thinnest points of the active layer closer to the free end.

FIG. 1B illustrates a side view of an embodiment of a non-uniform thickness actuator, showing the most responsive portions located at the thinnest points of the active layer closer to the cantilevered end.

FIG. 2 illustrates a side view of a non-uniform thickness actuator fixed at one end, with the thickness of the active layer decreasing towards the fixed ends.

FIGs. 3A-3C illustrate a cross section of a typical hydrofoil or airfoil with a non-uniform thickness actuator, in actuated and non-actuated configurations, attached to the surface of the foil.

FIG. 3D illustrates a cross section of a typical hydrofoil or airfoil with a non-uniform thickness actuator integrated into the foil.

FIG. 4 illustrates an embodiment of a non-uniform thickness actuator having stacked electroactive layers, wherein the stacks on either side of the bond interface are alternately activated.

FIG. 5 illustrates an embodiment of a non-uniform thickness actuator having multiple electroactive layers.

FIG. 6 illustrates thickness variation of a single layer of an actuator.—

In the Claims:

Please amend claims 1, 6, 10, 16, 18 and 19, as follows:

1. (Amended) An electroactive device, comprising:
at least two layers of material, each layer having a length, width and thickness dimension; wherein at least one layer is an electroactive material and wherein at least one layer of electroactive material is of non-uniform thickness; and
means for bonding the layers to one another.